COLONY OF SEYCHELLES

ANNUAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

FOR THE YEAR, 1959

PRICE Rs. 3/--

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I. General Review

1. The British Crown Colony of Seychelles is 157 square miles in area and consists of 92 islands, 28 of which are granitic and mountainous and lie in 3 neighbouring groups between latitude 4 and 5° South and longtitude 55 and 56° East ; the 64 other islands are flat and madreporic, being either sand-cays or elevated reefs, and, with 2 exceptions, lie in 4 main groups across some 650 miles of sea, in a rough south-westerly direction. Mahé, which is the main island and also the largest granitic island of the Colony, is 17 miles long and up to 7 miles wide and has an area of 55 square miles. The Colony's land classification is as follows :—

Land under coconuts, with fruits and other trees	64.0 sq. miles
Forest or land suitable for forest	14.8 ,, ,,
Permanent pasture	1.5 ,, ,,
Arable land	1.2 ,, ,,
Other land	75.5 ,, ,,
Total	157.0 ,, ,,

Other land consists of boulders, elevated reefs and other surfaces unsuitable for agriculture. The Colony's land distribution is as follows :—*

	Number of Holdings of land
1 acre and under	1,009
1 ,, to 5 acres	619
5 ,, to 10 ,,	169
10 ,, to 25 ,,	171
25 ,, to 50 ,,	95
50 ,, to 80 ,,	38
80 ,, to 100 ,,	12
100 ,, to 200 ,,	34
200 ,, to 300 ,,	13
300 ,, to 400 ,,	11
400 ,, to 500 ,,	7
500 ,, to 800 ,,	8
800 ,, to 1,000 ,,	4
1,000 ,, to 2,000 ,,	4
2,000 ,, to 4,000 ,,	2
Total	2,196

2. The economy of the Colony is almost entirely based on agriculture. There are 3 main agricultural industries : coconut, cinnamon and vanilla.

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* Extracted from "The Economy of the Seychelles and its Future Development", by J. W. F. Rowe.

3. Some 15,000 acres of Crown Land, about half of which is leased, come under the supervision and administration of the Department of Agriculture. The most distant Crown Land, the Aldabra atoll, is situated 630 miles from Mahé. All the distant Crown Lands are leased.

4. Up to 1953, the Department was largely concerned with the supervision and administration of these Crown Lands and especially of estates which had been acquired during the war and post-war years and which were run on a commercial basis. As a result the Department had little time to devote to research work and to extension services. Following a change in policy and the help of generous grants from the Colonial Development and Welfare Fund, the Department is now assuming its proper role. The estates are being leased to small land-holders under the Land Settlement Scheme. Research officers have been appointed and have assumed duty. A Research Station has been planned. Extension Services are also starting. The future activities of the Department and the proposed Agricultural Development Works are outlined in "A Plan For Seychelles", which was adopted by the Legislative Council in November, 1959.

5. As stated in previous annual reports, the policy of the Department may be summed up as the practice and encouragement of optimum long-term use of the land and its products, and other natural resources, in the best interests of the population. To obtain this objective and to discharge its functions, the Department is organised into 7 divisions, including those of Forestry and, until 1959, of Fisheries, employing 46 officers. To advise the Government and the Director on all agricultural policy, there is an agricultural Board, whose members are appointed by His Excellency the Governor and whose Chairman is the Director of Agriculture.

6. The Department was seriously depleted of staff in 1959. The post of Director was vacant during the whole year, the Agricultural Chemist acting as Director. The Entomologist and the Agronomist assumed duty in March and May respectively. The Agricultural Officer returned from post-graduate studies in September. The Land Settlement Officer relinquished his post in July, for health reasons, and had not been replaced by the end of the year.

7. The main achievements in 1959 were the launching of several important Colonial Development and Welfare Schemes. As detailed below there were 8 such schemes in operation in 1959:

The Re-afforestation Scheme, started in 1950
The Land Settlement Scheme, started in 1957
The Agronomist Scheme, started in 1959
The Pest Control Scheme, started in 1959
The Fertilizer Scheme, started in 1959
The Animal Husbandry Scheme, started in 1959
The Clearing of Bracken Fern Scheme, started in 1959
The Fisheries Development Scheme, started in 1959.

Other development schemes, such as the Air Survey and the Survey of the Water Resources of the larger islands, which were carried out in 1959, although not the concern of the Department, should benefit the agriculture of the Colony indirectly. The appointment of the first Co-operative Development Officer of the Colony was also a welcome event in 1959.

8. As the coconut industry is the main industry of the Colony, the Department is of course primarily concerned with it. There are some 29,000 acres under coconut in the Colony. Although the prices of copra remained very renumerative in 1959, the production of copra for export showed a considerable decrease on the previous year. Following the visit of a Coconut Expert in 1958, and the publication of his report at the end of that year, the Department was engaged in 1959 in implementing some of the more important recommendations contained in that report. A Pest Control Scheme and an Agronomist Scheme were thus launched, with the object of controlling the noxious coconut trunk borer *Melittomma* and assessing the fertilizer requirements of the coconut soils of the Colony. Moreover, to encourage coconut planters to manure their palms and to start reverting the decline in the coconut crop, a Fertilizer Scheme was initiated, whereby some 185 tons of subsidized fertilizers were made available to coconut planters at half the landed cost. The creation of coconut nurseries was also planned, to supply selected seedlings to coconut planters from 1960.

9. The cinnamon industry is the second in importance of the Seychelles industries. Cinnamon grows semi-wild on some 25,000 acres of hill-sides in the Seychelles, the cinnamon bushes being slashed down at regular intervals for cinnamon leaf and cinnamon bark. The cinnamon products which are exported are cinnamon leaf oil and cinnamon bark. Although the prices of cinnamon leaf oil remained low in 1959, demands for this product continued, which resulted in a large export. On the other hand the prices of cinnamon bark continued to be very remunerative, which resulted also in a large export. As during 1957 and 1958, the Department has been concerned in 1959 with the production and establishment in the United Kingdom and on other markets of a fine-grade type of Seychelles cinnamon quills.

10. Vanilla is the third in importance of the Seychelles industries and occupies some 500 acres of land. A good crop of vanilla was obtained in 1959. Following a good flowering season in September and October, a good crop may also be expected in 1960. Due to the greatly improved prices of vanilla during the last five years, vanilla is once more eagerly grown in the Seychelles. The Department encouraged the extension of vanilla growing by supplying thousands of cuttings from Crown Lands free of charge to planters in 1959. A watch was also made for the anthracnose disease which wiped out the industry at the beginning of this century.

11. Of the minor crops which are or could be grown in the Colony, the Department was especially concerned in encouraging the production of swamp rice and coffee. Although the former has been proved to yield well under the Seychelles conditions, private planters have shown little interest in it yet. Coffee, on the hand, has been a popular crop. Several thousand Robusta Coffee seedlings were distributed to planters in 1959. Plans have been made to distribute more seedlings in 1960.

12. Research work, in 1959, consisted mainly in investigations in the control of the coconut trunk borer *Melittomma*. The Entomologist has succeeded in devising a method of control, which involves the gouging of the infested coconut tissues and the coating of the exposed surfaces with a creosote-coaltar mixture. This method is very effective and is a vast improvement on the previous method of control by fumigation with paradichlorobenzene.

13. The Colony received the visit, in 1959, of a Senior Veterinary Adviser, whose task was to advise the Seychelles Government on animal husbandry and veterinary matters. His recommendations will be used as a working basis for developing and improving the local livestock industry, in conjunction with the proposed agricultural development.

14. Although handicapped by the shortage of staff, the Land Settlement Scheme kept apace in 1959 and should reach the target set out for 1960. This important scheme, which aims at creating a contented population of small farmers, to produce food-crops for local consumption and subsidiary export crops, should result in profound beneficial effects both socially and economically.

15. The Re-afforestation Scheme progressed satisfactorily in 1959. The main work consisted in the re-afforestation of Crown Lands burnt during the forest fires of 1958. The Colony was favoured by the visit, in April and May, of the Forestry Adviser to the Secretary of State, who was able to assess the work carried out since 1950 and to offer excellent advice on the present and proposed works.

16. Due to the delay in the appointment of the Fisheries Development Officer, no fisheries development work was carried out in 1959.

II. Weather

17. Total rainfall was markedly deficient in 1959, 79.19 inches having been recorded at Victoria, compared to an average of 90.64 inches for the last 56 years. Except for the months of January and November, during which rainfall was above average, rainfall was below average every month in 1959, especially in June and July. Rain distribution, however, was very much less irregular than in 1958. The following table was kindly supplied by the local office of the East African Meteorological Department.

Rainfall and Air Temperature — Victoria

Month	Rainfall in 1958 inches	Rainfall in 1959 inches	Average Rainfall for 56 years inches	Air Temperature (Farenheit) Mean Max.	Mean Min.	Highest Max.	Highest Min.
January	7.25	19.00	14.58	85.1	76.3	90.1	74.0
February	23.93	8.22	10.36	85.7	78.0	89.3	75.1
March	4.09	6.57	8.57	85.7	76.8	90.8	74.1
April	5.13	7.38	7.43	87.6	78.2	90.1	76.0
May	10.42	4.05	6.80	86.0	78.0	91.1	73.0
June	10.64	0.81	3.77	82.8	76.1	86.1	72.7
July	4.53	0.69	3.37	80.8	74.8	83.5	72.4
August	0.88	1.40	2.57	81.1	74.8	83.1	72.0
September	1.13	4.59	5.28	82.8	76.8	85.9	75.3
October	0.61	4.96	6.08	84.6	76.4	88.6	73.3
November	6.03	9.11	8.61	86.0	76.1	90.0	74.0
December	14.75	12.41	13.22	85.6	77.1	87.7	73.3
Total	89.39	79.19	90.64	84.5	76.6	91.1	72.0

Total Rainfall at other Recording Stations in 1959

Mahé Mont d'Or	115.44 inches (1,300 feet above sea level) ; average for last 12 years 108.40 inches.
Praslin (21 miles from Mahé)	59.57 inches (at sea level) ; average for last 14 yeare 75.92 inches.
La Digue (27 miles from Mahé)	53.00 inches (at sea level) ; average for last 15 years 60.64 inches.
Denis Island (60 miles from Mahé)	64.17 inches (at sea level) ; average for period 1951 — 1958 60.82 inches.
Daros Island (140 miles from Mahé)	63.40 inches (at sea level) ; average for period 1951 — 1958 55.84 inches.
Alphonse Island (212 miles from Mahé)	37.15 inches (at sea level) ; average for period 1949 — 1958 52.67 inches.
Aldabra Atoll (630 miles from Mahé)	13.74 inches (at sea level) ; no record available for previous years.

III. The Coconut Industry

18. Production of copra for export was 4,570 tons in 1959, compared to 5,600 tons in 1958. This large decrease in production may be attributed partly to unfavourable climatic conditions in 1958, when rainfall was very irregularly distributed and was markedly deficient in the months of September and October. and partly to other factors, such as increased local consumption, losses due to the coconut trunk borer *Melittomma*, senility of plantations and the gradual impoverishment of the coconut soils.

19 Prices realised by copra in 1959 were from £85.16.0d. to £91.13.0d. per ton f. o. b. The average price was £89.0.4d. per ton compared to £72.19.3d. per ton in 1958. The local selling price ranged from Rs. 924 to Rs. 1,044 per ton, compared to Rs. 685 to Rs. 875 per ton in 1958. The decreased value of the crop, due to the drop in production, was largely offset by the increased prices obtained. As previously, all the copra was sold by the Seychelles Copra Association and was exported to India, where the Seychelles F. M. S.* grade copra appears to obtain a premium. The Association's Cess remained at 2% and the export duty at 9%. The following table gives the copra production for export, the actual copra exports and their values for the last five years.

Copra Production for Export and Actual Export 1955 to 1959

Year	Production Metric Tons	Value f.o.b. Rupees	Export Metric Tons	Value f.o.b. Rupees
1955	5,846	4,730,530	6,313	5,190,018
1956	5,738	4,783,333	5,579	4,589,233
1957	6,000	5,257,398	5,900	5,176,198
1958	5,605	5,492,451	5,599	5,447,063
1959	4,570	5,452,225	4,406	5,238,346

20. Supplies of coconut oil and poonac (coconut cake) and soap were adequate, although there is a large prospective and unsatisfied local market for coconut cake, the production of the latter being limited by the local market requirements in coconut oil. A small coir factory continued to produce small quantities of fibres and cordage for local use.

21. To encourage coconut planters to manure their coconut palms and to start reverting the decline in the coconut crop, 185 tons of fertilizers were distributed to coconut producers at half the landed cost in 1959 with the help of a grant from the Colonial Development and Welfare fund. The fertilizer mixtures supplied were 15N : 15K, for the calcareous sandy flats and the outlying madreporic islands, and 6N : 26P : 6K for the lateritic hill-side soils of the granitic islands, which are apparently deficient in phosphorus. The response to this fertilizer campaign has been satisfactory. Another campaign has been planned for 1960.

*Fair Merchantable Sundried.

22. On certain granitic islands the coconut trunk borer *Melittomma insulare* Fairm and the coconut beetle *Oryctes monoceros* Ol., especially the former, continued to be serious pests. Infestations of coconut palms by scale insects and mealy bugs, with resultant fumagine, continued also on certain madreporic islands.

IV. The Cinnamon Industry

23. Of the two cinnamon products which are exported, cinnamon leaf oil and cinnamon bark, the former, which is used mainly for the manufacture of synthetic vanillin, continued to suffer from the competition of lignin-vanillin, a cheap by-product of the woodpulp industry, and fetched relatively low prices, but was still in demand. Cinnamon bark, on the other hand, on account of the shortage of supplies of cassia bark from the East, continued to obtain very remunerative prices. The local price of cinnamon bark ranged from Rs. 420 to Rs. 575 per ton compared to Rs. 325 to over Rs. 1,000 in 1958. Although the export of cinnamon quills, which are tightly rolled, thin, scraped cinnamon bark, declined in 1959, the value of this produce increased. The total value of cinnamon products exported in 1959 amounted to nearly $\frac{1}{3}$ of the value of the copra export. The following tables give the quantities and values of cinnamon leaf oil and cinnamon bark exported in recent years.

Cinnamon Leaf Oil Exports 1955 — 1959

Year	Quantity in Tons (Long Tons)	Value in Rupees f. o. b.
1955	85	910,977
1956	95	879,494
1957	58	555,313
1958	82	582,026
1959	91	876,239

Cinnamon Bark Exports 1955 — 1959

Year	Quantity in Tons (Long Tons)	Value in Rupees f. o. b.
1955	415	167,667
1956	586	251,665
1957	596	251,667
1958	1,063	723,662
1959	1,048	799,615

Cinnamon Quill Exports 1957 — 1959

Year	Quantity in Tons (Long Tons)	Value in Rupees f. o. b.
1957	$8\frac{1}{4}$	35,000
1958	$5\frac{1}{2}$	27,500
1959	$3\frac{3}{4}$	24,849

24. In 1959, the Department continued to produce small quantities of fine-grade, cigar-length (6 inch), cinnamon quills on the Grand'Anse farm, for shipment to the United Kingdom, where this product fetched between 5/3 and 5/6 per pound, in an endeavour to establish this cinnamon product on the English market. Later in the year fine-grade long cinnamon quills, 3 feet in length, were also made by telescoping shorter quills, as it was intimated by the Tropical Products Institute that this grade of quills is the one required on the large South-American market. A report is expected on these long quills. Although local producers are not yet keenly interested in the production of cinnamon quills, due to the large demands and the remunerative prices obtained by the easily prepared ordinary cinnamon bark, there is the hope that the Seychelles cinnamon quills may be able, eventually, to capture part of Ceylon's trade in that valuable commodity.

V. The Vanilla Industry

25. For the fourth year in succession a good vanilla crop was obtained. As very remunerative prices also prevailed in 1959, overseas auction prices varying from 61 shillings to 98 shillings per pound, and local prices ranging from Rs. 25 to Rs. 50 per pound, the revival of this industry, which was the most important agricultural industry of the Colony at the beginning of this century, was greatly stimulated. More areas have been planted under the orchid and better attention was given by the growers to old plantations. Following favourable conditions at flowering time, a good crop may also be expected in 1960. The following table gives the quantities and values of the exports in recent years :

Exports of Vanilla 1955 — 1959

Year	Quantity in Kilogrammes	Value in Rupees f.o.b
1955	522	16,380
1956	7,580	285,615
1957	4,245	195,182
1958	6,000	423,025
1959	4,510	485,156

26. To encourage the growing of vanilla the Department distributed over 125,000 vanilla cuttings, free of charge, to growers in 1959.

27. A watch was also made, in 1959, for the anthracnose disease which wiped out the local vanilla industry at the beginning of this century. This disease is caused by a saprophytic fungus, *Glomerella vanillae* (Zim.) Petl., which under certain conditions of humidity and vine debility invades the stems, leaves and sometimes the fruits of vanilla. Several cases of infestations, two of which serious, were detected in 1959. The serious cases were controlled by the destruction of the infested vines and by spraying the vines in the neighbourhood with Bordeaux mixture.

VI. The Patchouli Industry

28. The patchouli products which are exported from the Seychelles are patchouli oil and dry patchouli leaf. Patchouli oil is used mainly in perfumery, as a fixative for other finer perfumes. The Seychelles patchouli oil has to compete on the essential oil market with Singapore patchouli oil, which is produced mainly in Malaya. Limited demands and low prices are responsible for the decline of that once remunerative peasant industry. The following table gives the quantities of patchouli oil and leaf, and their values, exported in recent years :

Patchouli Leaf and Oil Exports 1955 — 1959

Year	Oil Exports		Leaf Exports	
	Kilogrammes	Rupees f.o.b.	Tons	Rupees f.o.b.
1955	436	34,491	38	14,200
1956	532	27,225	9	16,013
1956	1,200	50,450	7½	14,789
1958	103	4,156	10	20,468
1959	252	14,017	12¾	35,499

VII. Other Industries

29. The other minor, industries of the Seychelles may be divided into 5 groups : agricultural and forestry, livestock, marine, mineral and curios.

(a) *Agriculture and Forestry*

30. Apart from coconut, cinnamon, vanilla and patchouli, the Colony also exports various other minor crops such as cloves, nutmegs, coco-de-mer (Lodoicea) nuts, eucalyptus oil, etc. Other crops, produced only for local consumption, consist of coffee, tobacco, bananas, breadfruit, sugarcane and bacca, which is fermented sugar cane juice, coconut toddy and the usual range of tropical, sub-tropical and, to a much smaller extent, temperate climate food-crops.

31. No timber is imported in the Colony, the local requirements being obtained from the forests of the islands. As in previous years the Forestry division of the Department of Agriculture supplied almost the total timber requirements of the Public Works Department for the numerous buildings erected by it. The Colony's requirements of wood-fuel, which is the main fuel used for cooking and, to a lesser extent, in essential oil distilleries are also produced locally.

(b) *Livestock*

32. There is little demand for livestock produce and, as a result, few animals are kept. This is attributable to the availability of fish and the very low purchasing power of the great majority of the population. The Department of Agriculture is the largest producer of milk and livestock, its Union Vale dairy, on Mahé island, producing some 200,000 pints of milk every year, mainly for the supply of the township of Victoria, and selling its livestock regularly at auction sales.

(c) *Fisheries and Sundry Marine Produce*

33. The export of salted fish, including shark and sharkfins, was lower in 1959 than the already low export of 1958. The exports were to East Africa and Ceylon. Although there is a ready market in East Africa for salted shark, that for salted fish is limited. The following table gives the quantities and values of salted fish exported in recent years :—

Exports of Dry-Salted Fish (Including Shark and Sharkfins) 1955 — 1959

Year	Long Tons	Value in Rupees f.o.b.
1955	189	159,231
1956	240	213,103
1957	183½	169,669
1958	147	133,788
1959	120½	93,660

34. Green turtles, which are mainly obtained from the distant Aldabra atoll, and whose meat is relished by Seychellois, were as usual on sale at Victoria. There is a small but remunerative trade in calipee and calipash, which are made from the cartilage joining the shell of the green turtle to its plastron and which are exported to Hong Kong for soup-making. The recorded export of calipee and calipash in 1959 is 5,168 kgs., valued at Rs. 74,719.

35. Tortoise shell, from the Hawksbill turtle, was not in great demand in 1959. This industry suffers from the competion with plastic materials. The quantity of tortoise shell exported in 1959, was 307 kgs., valued at Rs. 1,840.

36. Overseas demand for Turbo, oyster and other shells continued in 1959, 4½ tons having been exported, valued at Rs. 8,860.

37. The collection and local consumption of nestlings of Wedgetails, Shearwaters and the eggs of Sooty-Tern and Common Noddy continued in 1959. The following are the declared landings of eggs from the egg-islands :

Island	Sooty Tern Eggs Cases	Common Noody Eggs Cases	Unspecified Eggs Cases	Total Cases
Aride	227½	—	—	227½
North Cousin	—	—	—	—
South Cousin	—	—	12	12
Farquhar	—	—	—	—
Desnoeufs	—	—	2,283	2,283
Frigate	—	—	110	110
Bird	—	—	—	—
Recif	—	—	—	unavailable
Eagle	—	—	74	74
African Banks	—	—	108	108
Remire	—	—	120	120
	227½	—	2,207	2,934½

It can be assumed that each case contained an average of 700 eggs. Eggs sold at around 4 cents each.

(d) *Minerals*

38. Minerals exported from the Seychelles consist of bird guano and related phosphatic coral rock. Some 5,165 tons of guano, valued at Rs. 224,600 f.o.b., were exported in 1959, compared to 16,805 tons, valued at Rs. 699,403, in 1958. This guano was quarried on the leased Crown island of St. Pierre.

(e) *Curios and Zoological Specimens*

39. A small curios industry exists in the Colony, which produces articles made up of tortoise shell, sea-shells and palm leaf for the tourist trade. Another small industry is that of sailing boats, which are made with the best of the local timbers. There is a Home Industries in Victoria, which is run by a committee of ladies and where curios are sold to tourists and visitors from passing ships.

40. As the Aldabra atoll is the only place in the world where the giant land tortoise exists in a wild state, export of a limited number of this reptile is permitted every year to zoological gardens. In 1959 28 giant tortoises, valued at Rs. 1,680, were exported.

VIII. Livestock

41. The Department of Agriculture, which is the largest producer of milk and livestock in the Colony, runs the Union Vale dairy, a Veterinary Station and a Quarantine Station, near Victoria, on Mahe, and keeps stock on various other stations and sub-stations, including stud-bulls. The policy adopted by the Department until last year was to cross Sindhi and Friesian cattle to produce cross-bred animals, with good milch characters, suited to the tropical conditions prevailing in the Colony. As in past years, the milk produced at the Union Vale dairy was supplied to the township of Victoria and to Government institutions, while the livestock surplus produced was sold at regular auction sales, in Victoria to breeders and to the butchery.

42. From October to November, the Colony received the visit of a Senior Veterinary Adviser, Dr. D. E. Faulkner, Director of the Nyasaland Veterinary Services, who visited the Seychelles with the view to advising the Seychelles Government on veterinary and animal husbandry problems. His report, which had not been received by the end of the year, will be used as a working basis for developing and improving local livestock, in conjunction with the proposed agricultural developments.

(a) *Animal Husbandry*

43. Cattle, pigs, goats, ducks, fowls, guinea-fowls and a few turkeys, geese and donkeys are kept in the Colony, but the numbers are scarce. As stated above, the Department of Agriculture is the largest producer of livestock and livestock produce. The livestock produced by the Department, consisting of Sindhi×Friesian cattle, Large White pigs

and Rhode Island Red poultry, is well appreciated by breeders and is eagerly sought at the regular auction sales held in Victoria. However, there has been no large increase in livestock keeping in recent years. There exists a great need for extension work to arouse interest in livestock in general. It is proposed to do so in the course of the future development works.

44. The Union Vale dairy functioned satisfactorily in 1959, supplying pure, clean milk to the population of Victoria and to Government institutions. The herd, which consists of Friesians and Sindhi-Friesian crosses, was generally very healthy. An average of 61 cows were in milk at Union Vale, in 1959, and yielded an average of 3,500 pints per animal. Silage pits, at Union Vale and Grand'Anse, were filled with elephant grass and maize. As usual the product was palatable and was of great help during the dry South-East monsoon.

45. A total of 9 stud bulls, Friesian and Sindhi, were stationed on 5 stations and sub-stations in 1959.

46. As in previous year, diluted solutions of toxaphene, for the control of buffalo fly, mineral supplements, dairy disinfectants and other sundries were sold at the Veterinary Station of Union Vale.

(b) *Veterinary Work*

47. No epidemics occurred during 1959, but owing to the abnormally dry South-East monsoon some calves died both in the Grand'Anse farm and at the Union Vale dairy as a result of malnutrition.

48. The clinic, at Union Vale, was operated as usual, charging nominal fees or giving free treatment where owners were certified as being unable to pay.

(c) *Quarantine Station*

49. The animals quarantined at the Union Vale Quarantine Station consisted of 3 monkeys, 4 dogs and 5 canaries. Two of the monkeys were destroyed.

IX. Land Settlement

50. When the Seychelles Government purchased several large coconut and other estates on Mahe island during the war and postwar years, it was with the intention to use part of this land for small settlements. In 1953 a start was made to settle families on plots of land at Anse Boileau, where some 20 families were settled by 1957. These settlements having been a success, a Land Settlement Scheme was launched with a Colonial Development and Welfare grant, to cover the period 1957 to 1960, to settle 100 families on Crown Land, on Mahe. Each plot was to be 5 acres in area and was to be provided with an average of 2 acres of terraced hill-sides and a model 2-room cottage, with aqua-privy.

51. The object of this Land Settlement Scheme was to create a contented population of small farmers, who will engage in mixed hus-

bandry, under the control and with the advice of the Department of Agriculture, with the emphasis on production of food-crops for local consumption and likely subsidiary export crops, like coffee. The Scheme should have therefore profound beneficial effects, both economically and socially, on the quickly increasing population of the already over-populated Colony.

52. Although terracing and building work started in 1957, the Land Settlement Officer was only appointed and assumed duty in June, 1958. For health reasons he had to relinquish his post in July, 1959. Work continued, however, under the Acting Director of Agriculture and the Land Settlement Technical Officer, until September, 1959, when the Agricultural Officer returned from post-graduate studies and was entrusted with the Scheme. A new Land Settlement Officer had not been appointed by the end of the year.

53. In spite of the shortage of staff and inherent "teething" difficulties, the Scheme has kept apace. By the end of 1958 bench-terraces for some 85 settlements had been completed. By December, 1959, 128 settlements had been bench-terraced and demarcated and 85 of them, including 20 settlements of the pilot scheme, were in occupation. It is expected to allocate some 30 more settlements by the end of March, 1960. Settlements have been allocated in three areas in Mahe : Anse Boileau, Foret Noire and Rose Belle. Plans have been made to extend the Scheme for a further 3-year period, from 1960. Consideration has also been given to a similar scheme for Praslin island, which is the second largest island of the Colony.

54. Up to the end of 1959, a certain amount of relaxation of control over the choice of crops was exercised, the settlers being only encouraged to produce food-crops and limited quantities of high value cash-crops, such as coconut, vanilla, tobacco and coffee. This policy has been taken up with interest by the settlers and several settlements carry promising plots of these crops. It has been planned, however, now that the constructive phase of the Scheme is practically over, to adopt cropping programmes, in order that a better use can be made of the land by the settlers. This consolidation work will be the responsibility of the new Land Settlement Officer, with the advice and help of the Agricultural Officer.

55. The Land Settlement Scheme Demonstration Plot, which was started at Anse Boileau, in 1958, continued in 1959 and attracted considerable interest amongst small planters and large planters alike. Crops demonstrated on this plot included rice, coffee, pineapple, banana, root-crops and vegetables.

X. Extension Work and Sundry Services

56. Due to lack of staff and facilities no proper Extension Services exist in the Department yet. However, with the proposed staffing and the planned development works, it should be possible to build up useful and efficient services in the years to come. A beginning was made towards this, in 1959, by maintaining the Land Settlement Scheme demonstration plot at Anse Boileau, by holding an Agricultural Field Day and a Settlers' Day, also at Anse Boileau, in June and August res-

pectively, by holding several planters' meeting at the Headquarters of the Department and elsewhere, to discuss such topics as coconut manuring, cinnamon quill making and coffee husbandry, by arranging for a Government team of cinnamon quill makers to tour the island of Mahe, to demonstrate quill-making, by inspecting and treating vanilla plantations infested with anthracnose, by publishing frequent articles in the press on agricultural, animal husbandry and forestry matters and by offering advice, if and when requested. Furthermore, the Agronomist and the Agricultural Officer were able to visit a number of planters to advise them on coconut and coffee husbandry.

57. A small beginning was also made, in 1959, in agricultural instruction, when six boys, of primary school leaving-age, were taken on a field instruction course on the Demonstration Ilot of the Land Settlement Scheme, at Anse Boileau. The boys received instruction from the Technical Officer of the Land Settlement Scheme in root-crop and vegetable growing. They received apprentices' salary and were also allowed to take home the crops grown by them. It is proposed to extend as soon as possible this field instruction course, which has been very popular and for which numerous applications have been received from young boys.

58. As in previous years, sundry services rendered to the planters or the public at large and to other Government Departments have consisted, in 1959, in providing, supplying or issuing :

(a) Veterinary treatment to sick animals and sales of veterinary drugs,

(b) Quarantine facilities for imported animals,

(c) Export certificates for animals,

(d) Sales of cattle, poultry and pigs for breeding or slaughter,

(e) Sales of milk to Victoria customers and supply of milk and and other produce to Government institutions,

(f) Sales of tested vegetable seeds at non-profit prices,

(g) Sales at normal prices, or issues free of charge, of planting material,

(h) Sales of imported fertilizers and pesticides at non-profit prices,

(i) Laboratory analysis or testing of essential oils and other produce prior to export,

(j) Inspection of copra, cinnamon bark and salt fish, at the Custom Sheds, prior to export,

(k) Inspection of plant imports and inspection and certification of plant exports,

(l) Valuation of land and crop estimates,

(m) Distillation of essential oils on demand,

(n) Crushing of copra for oil, to offset a temporary shortage of edible oil,

(o) Distribution of beneficial insects,

(p) Fighting of forest or bush fires,

(q) Supply of timber to the Public Works Department and the Technical Centre of the Education Department.

59. The Acting Director of Agriculture, the Agricultural Officer and the Inspector of Plantations were also frequently engaged, as in previous years, in the valuation of land for the Registry of Deeds and for the Agricultural Bank.

XI. Experimental Station, Investigations and Trials

60. Although there is no proper experimental station in the Department yet, a number of trials and investigations were carried out on the Grand'Anse farm, which is situated on the West coast of Mahe, and at other stations or sub-stations. Plans have been made to convert the Grand'Anse farm into a Research Station in 1960, to carry out trials and research work on the main and other crops and on livestock, The Agronomist's Laboratory and Office, which are being built, will also be situated at Grand'Anse. The following works were affected in 1959 :

(a) *Coconut*

61. Some fertilizer trials have been laid down by the Agronomist on the madreporic island of Denis and Daros to discover the effect of added macro-nutrients on coconut yields. The results from these trials will not be obtained for at least two years.

62. The Entomologist, following trials with a creosote-coaltar mixture, has devised a method of control of the coconut trunk borer *Melittomma*, which is a vast improvement on the previous method of control with paradichlorobenzene. Details on this are given in Section XIII.

63. Attempts have been made by the Entomologist to introduce *Scolia* wasps from North island to Praslin and La Digue islands, to control the coconut rhinoceros beetle, which is especially prevalent in those islands. Details on these attempts are given in Section XIII.

64. Consignments of a *Cryptolaemus* lady-bird and of a tiny *Tetracnemus* wasp were received from California and liberated on the madreporic Poivre island to control the long-tailed mealy-bug. Details on these introductions are also given in Section XIII.

65. Specimens of diseased coconut wood, collected by an Entomologist of the South Pacific Commission, Dr. Paul Surany, who visited the Seychelles in 1958, have been examined in East Africa and found to be infested with nematodes. Although the latter have not been finally indentified, they have been declared as not being the causative agent of the dreaded Coconut Red Ring Disease.

66. Plans have been made to create two coconut nurseries in 1960, one in Mahe and the other one in Praslin, to produce selected coconut seedlings.

(b) *Cinnamon*

67. The production of fine-grade cigar-length (6 inch) cinnamon quills continued at Grand'Anse. Small consignments of this product were exported regularly to the United Kingdom in 1959, in an endeavour to establish it on the spice market. The prices realised by

this were from 5/3 to 5/6 per pound. A successful attempt has also been made to produce long (3 foot), fine-grade, cinnamon quills, by telescoping short quills. A bundle of these long quills was shipped to the United Kingdom for examination. No report had been received on it by the end of the year. It has been intimated by the Tropical Products Institute that the production of quills of this type would be essential if the Seychelles were to capture the large American trade in this commodity.

68. Ten Ceylon cinnamon seedlings were obtained from the Royal Botanic Gardens of Kew, in 1959. They are being grown at Grand' Anse, under observation. These seedlings will be very useful for future work on cinnamon, especially to elucidate the reasons for the difference in quality between the Ceylon and the Seychelles cinnamon bark and oil.

(c) *Vanilla*

69. Following the report of cases of diseased vanilla vines in Mahe and Praslin, the Agronomist inspected the diseased plantations and submitted specimens to the Commonwealth Mycological Institute, from which *Glomerella* fungi were isolated. As *Glomerella vanillae* (zim.) Petl., is reported to have wiped out the vanilla plantations of Mahe island at the beginning of this century, the infestations referred to above have probably been caused by a resurgence of the old anthracnose disease. The badly diseased vines were burnt and the neighbouring and apparently healthy vines were sprayed with Bordeaux mixture, which succeeded in stopping the spread of the infestations. Inquiries at the Vanilla Research Station of Antalaha, Madagascar, about anthracnose-resistant vanilla have been of no avail, as no such resistant strain of vanilla has been developed there yet.

(d) *Rice*

70. Trials in growing swamp rice were continued on the Land Settlement Scheme Demonstration Plot, at Anse Boileau, in Mahe, in 1959. The variety used was Radin Siak II, a salt-water resistant strain. The rice was sown in a nursery and later transplanted on approximately 1 acre of drained swamp land. The yield obtained has been very satisfactory, 2,215 lbs. of paddy having been collected. Although this trial has created considerable interest, few planters have taken to rice planting yet, the main objection being the difficulty of controlling the Cardinal weaver bird *Foudia madagascariensis* (Linn.) which takes a heavy toll on rice crops if uncontrolled. Following a recommendation from the Commonwealth Bureau of Pastures and Field Crops, an Exid Thunderbird Cannon bird-scarer has been ordered for trial and demonstration on the Demonstration Plot.

(e) *Coffee*

71. The $\frac{1}{4}$ acre Robusta coffee plot, on the Grand'Anse estate, yielded well in 1959 and demonstrated the practicability of growing coffee on the lateritic hill-side soils of the granitic islands. Following renewed interest amongst a number of Seychelles planters in coffee growing, the Department of Agriculture distributed some 9,000 Robusta seedlings in 1959. Plans have been made to produce some 100,000 seedlings in 1960.

(f) *Patchouli*

72. A report on the samples of patchouli oil and dry patchouli leaf obtained from a small trial plot of Malayan-imported patchouli was received from the Tropical Products Institute. The Malayan patchouli was introduced to find out whether the difference in quality between Singapore and Seychelles patchouli oils could be attributed to varietal or other factors. The result of the investigation has been disappointing, there being no striking difference between the oil from the Seychelles and Malayan patchouli grown in the Seychelles.

(g) *Other Investigations*

73. Other investigations and trials were also carried out, in 1959, by the Agronomist, the Entomologist and the Forester, accounts of which are given in Section XII, XIII and XIV.

XII. Agronomy

74. In response to the recommendation by F. C. Cooke in his report on the Seychelles Coconut Industry, the Agronomist was appointed and took up his duties in May. His work is to discover means of improving the yield of coconuts and other economic crops. In the absence of basic information on the distribution of soil types and their relative nutrient status, he will have to carry out a reconaissance soil survey and accumulate yield data under the varying soil and climatic conditions in the territory.

75. The soil survey has been postponed until the aerial survey photographs arrive, as there are no accurate maps of the islands. Moreover laboratory work has been impossible, as the laboratory building will not be completed until March, 1960. In addition, a glasshouse for studying the effects of soil types on plant growth has not yet arrived in the territory. As a result the Agronomist has therefore been working on other aspects of the problem of yield improvement.

76. In connection with the Fertilizer Scheme mentioned elsewhere, he addressed three planters' meetings on the benefits to be obtained from the use of these fertilizers and visited a number of estates in the central group of islands to demonstrate the best way to apply them. These visits were extremely valuable in that it was possible to study the coconut under different conditions and types of management ; to suggest improvements in the standards of husbandry and to assess the possible reasons for the decline in estate yield and copra exports.

77. It can be stated categorically that the main reason for the decline in coconut yield has been the low standard of management adopted by the majority of planters in the past. Pests and diseases have taken their toll, but in most cases these can be kept under control by suitable methods and that is a part of "good management". The fertility of Seychelles soil has been ruthlessly exploited, little manuring of any sort has been carried out and waste products have not been returned to the land. Little attempt has been made to replant systematically and, as a result, the majority of palms are now reaching the end of their economic life and the large-scale replanting needed soon will be

a major operation instead of part of the normal estate routine. Uneconomic and non-bearing palms have been allowed to survive in the hope that "they may bear one day" whilst, on Mahe, cinnamon has been allowed to compete with the palms for the limited supply of plant nutrients. Many excuses have been offered to account for the poor management but it is certain that, unless improvements are made, yields will continue to fall.

78. In addition to estate visits on the granitic islands, the following "coral" islands were visited by the Agronomist for varying periods : Poivre, Daros, Des Roches and Denis. On these islands the major problems are the conservation of both water and soil borne plant nutrients. The water storage capacity of the soil is limited and the annual rainfall is only just sufficient for coconut growth. A succession of dry years, admittedly an unlikely occurrence, would be disastrous and every effort should be made to reduce the annual evaporation and transpiration to meet this contingency. The only sources of plant nutrients are the coral and any guano present and the continuing export of copra is depleting the reserves. It will become essential to import fertilizer material to maintain crop yields and, on Daros and Denis, some fertilizer trials have been laid down to discover the effect of added macronutrients on coconut yields. The results from these will not be obtained for at least two years.

79. Similar fertilizer trials were also carried out on North Island, which is mainly granitic but has a guaniferous "plateau". Trials are planned for many properties on the main islands but the start of these has been handicapped by a lack of subordinate staff, a situation not remedied until December.

80. In progress is an investigation into the relation between rainfall and palm yields. A large number of records have been obtained from several properties and their analysis has been begun. Preliminary results indicate that yield is inversely proportional to the rainfall eleven months previously but the correlation is not very good, especially when there is a succession of very dry months. Eleven months before nutfall is the period in which maximum fall of immature nuts and unfertilised flowers occurs and so it is probable that the intensity and duration of individual rainstorms should be taken into account. Unfortunately, there are no detailed records of these. This preliminary investigation has been by graphical methods but statistical analysis of suitable data has been started.

81. For the last few months of the year, the Agronomist has been responsible for Grand'Anse Estate. This property has been under care and maintenance by the Department of Agriculture for some years but is being transformed into a Research Station ; the Agronomist helping with the necessary reorganisation. No special funds have been available for experimental work, but two large-scale demonstrations have been started. Firstly a very poor area of hillside is being improved, using the techniques recommended by the Department, in order to assess the value of these and to discover the relative profit of such improvement. A second area is being modified to investigate the possibility of growing cinnamon and coconuts together. Whilst, as a general rule, this is undesirable, there are certain places where, by nature of the terrain, coconut yields can never be high but are not bad enough to merit the

felling of the palms. Under these conditions a secondary crop is desirable and the method being adopted is to clear the cinnamon from within ten feet of every palm and to replant, where needed, in hedges running along the contour and about 25 feet apart, where it will act as an erosion barrier and not compete with the coconuts to any marked extent.

XIII. Entomology and Pest Control

82. Dr. I. W. B. Nye, a member of the Colonial Pool of Entomologists, was seconded to the Seychelles Government and arrived in March. His terms of reference were to report and advise on further control measures to be taken against *Melittomma insulare* Fairmaire, and other pests.

(a) *Melittomma Borer*

83. *M. insulare* is a beetle belonging to the family Lymexylonidae. The mechanical damage caused by the larvae, boring into the base of coconut palms, is itself very slight. Each larval tunnel is, however, preceded and surrounded by a zone of tissue affected by bacterial organisms with which the larvae are always associated. These areas gradually spread in all directions and coalesce, particularly in the moister central part of the trunk having relatively fewer vascular bundles. Once attacked by the micro-organisms these diseased areas can never recover and they gradually degenerate into brown and finally black rotten wood which in its turn breaks down, eventually leaving an empty cavity in the base of the trunk. In the case of younger palms the trunks are often so weakened that they fall long before reaching the hollow stage.

84. The treatment previously recommended consisted of partial excavation of the infested portion, insertion of paradichlorobenzene in the excavation and then complete mounding up of the whole base of the palm : the object being to achieve a kill of the *Melittomma* in the unexcavated portion of the trunk by fumigation of the larvae. During the period 1953 — 1958 the whole of Praslin and Curieuse Islands had been examined and over 60% of the palms were treated by this method.

85. As a result of an examination of treated palms in Praslin, during a visit in April, it was evident that the fumigation treatment was only partially successful. Many of the palms treated with paradichlorobenzene still contained heavy infestations and the associated rot was continuing to spread in the bole of the palms.

86. Tests and trials were then carried out in Mahe and the most promising treatment was developed. This consists of gouging out the rotting tissues through an opening as narrow as possible, being particularly careful to keep to a minimum the opening at ground level — the weakest point. All bared wood is then thoroughly painted with a mixture of 60% coal-creosote and 40% coal-tar. Within a quarter of an hour of painting with the creosote-tar mixture, the larvae can be seen hanging tail first out of their tunnels, dying.

87. Surveys of infestation carried out all over Mahe showed that an average of 57% of the palms on the coral and coastal flats and 83% of

palms on the hillsides are infested. It seems that the infestation in Mahe has built up severely within the last two or three decades, after the majority of the palms were passed the sappy susceptible stage. The very hard peripheral layer of the trunk then resists the spread of the rot for several years, but gradually and relentlessly, the ring of sound wood at ground level is whittled away and the palm then falls.

88. A detailed report on "The Control of *Melittomma insulare* Fairm. Attacking Coconut Palms in Seychelles" was compiled and submitted to Government in September. This report includes an account of the methods used and the results obtained during the treatment of Praslin in 1953 — 1958. The results of the surveys of infestation on Mahe and recommendations for the extension of control to other islands are also included.

89. A Colonial Development and Welfare Grant has been made for the retreatment and maximum control of *Melittomma* in Praslin. This retreatment commenced at the end of November employing eight teams, each consisting of a Melittomma Assistant in charge of six labourers. During the five weeks up to the end of the year, a total of 15,273 palms were examined, and treated if found to be infested, out of the total of 75,000 palms in Praslin. The following table shows the degree of infestation found :—

Uninfested	7,057	46.1%
New infestations	1,963	12.9%
Old residual infestations	6,224	40.8%
Fallen during or soon after retreatment	29	0.2%
	15,273	

New infestations mean new attacks since the 1953 — 1958 treatment. Old residual infestations represent sites of attack which have previously been treated but still contain an infestation of active larvae.

90. Nearly all the palms which had previously been treated with paradichlorobenze were found to contain residual infestations, and had to be opened up, regouged and painted with creosote-tar mixture. The degree of infestation remaining after this retreatment is very low and amounts to about five or less larvae in approximately 2% of the palms. At this level it is unlikely that a male and female beetle will emerge together during their brief adult life which lasts less than a week. It will however be necessary for a small team to continue to inspect the Praslin palms at about two yearly intervals to eliminate any remaining infestations which may develop.

(b) *Rhinoceros Beetle*

91. *Oryctes monoceros Ol.* This pest though prevalent throughout Seychelles, does not cause severe damage except in La Digue, where its repeated attacks on young palms cause very heavy losses.

92. Following a report of damage to young palms on Poivre Island an attempt was made to establish the parasitic wasp, *Scolia ruficornis* F. In mid July about 30 of these wasps were collected from North Island

(the only locality in Seychelles where they have become established) and brought back to Mahé. The wasps captured were all females and in spite of feeding on honey, within three days all but 9 died. A post-mortem examination showed that all the ovaries were empty and it was evident that these were survivors of a generation which had already completed oviposition. By the time Poivre was reached two days later all had died or were moribund.

93. In November, during a further visit to North Island, 68 *Scolia* wasps were collected and the following morning half of them were liberated at the R. C. Mission Estate, Grand'Anse, Praslin and the other half at l'Union Estate, La Digue. No further reports concerning them have been received.

(c) *Mealy Bugs and Scale Insects*

94. Mealy bugs and scale insects are being kept under adequate control by ladybird predators. Specimens of the Long Tailed Mealybug, *Pseudococcus adonidum* (L.) were taken at Poivre and Darros Islands. This is a new record for Seychelles. A consignment of ladybird predators, *Cryptolaemus montrousieri* Muls., was received from California and liberated on Poivre Island in March. A further consignment was received and liberated in July, but by then the infestation of the mealybug host was negligible. No *C. montrousieri* were found before liberating the second consignment and it is not known whether this species has become established on the island.

95. The July consignment of beneficial insects from California also included phials of minute wasps, *Tetracnemus peregrinus* (Comp.), which are parasitic on *Pseudococcus*. They were also liberated, but the low numbers of their host made it unlikely that they would become established.

(d) *Rats and African Barn Owl*

96. The African Barn Owl, *Tito alba*, which was introduced from East Africa in 1949, 1951 and 1952, to control rats in coconut plantations, is breeding and spreading. From the rare pellets collected on Mahé island it appears to be feeding mostly on rats, but is preying also on White Terns and Tenrecs *Centetes ecaudatus*.

(e) *Giant Snail and Predacious Gonaxis Snail*

97. The predacious snail *Gonaxis quadrilateris* Preston, which was introduced in the Seychelles in 1957 and 1958, to prey on the giant *Achatina* snail, and which had been recovered on Cerf island has now been recovered on Mahé island too.

XIV. Forestry

98. The main forest areas, which consist of some 4,000 acres and are also the principal catchment areas of the islands of Mahé and Praslin, are Government-owned. With generous grants from the Colonial Development and Welfare Fund, these areas have been largely re-afforested from 1950 onwards. There has been practically no re-afforestation work on private land.

99. In April and May the Colony received the visit of the Forestry Adviser to the Secretary of State, Mr. C. Swabey. It was the first visit to the Colony of a Forestry Adviser. During the 27 days of his visit, Mr. Swabey made an extensive tour of the Crown and private forest lands and catchment areas, and was able to assess the re-afforestation work carried out by the Forestry Division and to proffer advice on future works.

100. Re-afforestation work in 1959 consisted mainly in the planting of Crown Lands burnt during the 1958 forest fires, at Le Niol, Souvenir and Grand'Anse, on Mahé. The year began with the preparation of these areas for planting. By the end of 1959 a total of 230 acres had been planted. Prior to planting anti-erosion barriers, consisting of partly burnt cinnamon, which had been cut back, were erected along the contour of the burnt slopes. On the steep slopes, where soil conservation is an over-riding consideration, Sangdragon cuttings and Citronella grass were planted along the contour and made quick establishment. Most of the species which were planted, such as Takamaka, Agati, Santol and Jack were sown at stake, the forest nurseries being too far from the planting areas. Other species however, such as Calice du Pape, Silky Oak, Central American Mahogany and Chittagong Wood, could not be sown at stake and had therefore to be transplanted from the distant nurseries. There was little rain in late February and early March, which caused some mortality, but the light rains of late March and April encouraged growth. This and natural regeneration due to coppiced cinnamon, Albizzia and Herbe Tourterelle, resulted in an adequate cover. On some very steep slopes, however, where colonization is difficult, little work could be done. It is intended to try soil stabilization trenches prior to planting on these sites.

Cinnamon	*Cinnamomum zeylanicum*
Sangdragon	*Pterocarpus indicus*
Citronella	*Cymbopogon nardus*
Takamaka	*Calophyllum inophyllum*
Agati	*Adenanthera pavonina*
Santol	*Sandoricum indicum*
Jak	*Artocarpus communis*
Calice du Pape	*Tecoma leucoxylon*
Silky Oak	*Grevillea robusta*
Central American Mahogany	*Swietenia macrophylla*
Chittagong	*Chikrassia tabularis*
Albizzia	*Albizzia moluccanna*
Herbe Tourterelle	*Wikstroemia viridiflora*

101. A very important consideration in re-afforestation work in the Seychelles is the conservation of moisture during the dry South-East monsoon, from May to September. This is usually attained by mulching with various materials, usually Bracken Fern. As the latter has to be carried over hills on head, mulching is a costly operation. In 1959 the Assistant-Forester tried a system of overhead transport, on galvanized steel wires, which was a success and which reduced the cost of mulching by 50% in Le Niol area. Due to the campaign for the eradication of the highly-inflammable Bracken Fern, there will be little left for use as mulching material in the years to come. Consideration will therefore be given, in future, to relying on the soil cover existing on the planting sites.

102. In 1959 some 192 acres of the 2,500 acre of re-afforested land had to be thinned to provide growing space. The material obtained during this operation was converted mainly into charcoal and fire-wood. Consideration will be given in future to converting thinnings into timber for making light furniture.

103. Following the advice of the Forestry Adviser, the previous method of soil stabilization used on the denuded slopes of the Praslin forest area of Newcome, which can be described as "Pit Colonization", was altered to that of contour trenches, dished in the hill-sides at an angle. This new method of land preparation prior to planting appears to be much more effective and enabled the establishment of various species at Newcome, such as Mexican Pineapple, Gazon Trelle, Sisal, Citronella and even *Centrosema pubescens*. As already stated, this method will be used on the very steep burnt slopes, on Mahé island.

104. Trial plots of exotic species introduced by the Forestry Division were started in 1959, and were planted under Chittagong Wood, Central American Mahogany, *Acrocarpus fraxinifolius* and Bois Jaune in a burnt area, at Grand'Anse, in Mahé. It had been the practice to mix exotic species in the re-afforested areas. These trial plots will provide information on pure stands of these species. A trial plot of Vetivert grass, which is a material used for mat-making in home industries, was also started in 1959. Vacoa seedlings have also been raised for planting in trial plots, the Vacoa leaf being another material commonly used in home industries.

Bracken Fern	*Gleichenia dichotoma*
Mexican Pineapple	*Ananas sp.*
Gazon Trelle	*Panicum parvifolium*
Sisal	*Agave sisalana*
Bois Jaune	*Ochrosia borbonica*
Vetivert	*Vetiveria zizanzoides*
Vacoa	*Pandanus utilis*

105. Of the Seychelles endemic trees, Capucin, Bois Rouge, Bois de Natte and Gayac still exist, but there are only poor specimens of these species left. Bois de Fer, the only Seychelles representative of the order Dipterocarpaceae, which was thought extinct, was re-discovered in 1959. A group of young trees were found during Bracken Fern clearing. Later on six seedlings were also recovered at Perare, on Mahé.

106. Following a generous grant from the Colonial Development and Welfare Fund, a scheme for the eradication of the highly-inflammable Bracken Fern on some 500 acres of Crown Land was launched in 1959. Work started in December only, but by the end of the month some 230 acres of land had been cleared of Bracken. It is proposed to extend this eradication campaign to private land in 1960, to do away with the risk of forest and bush fires during the South-East monsoon.

107. Two bush-fires occurred in 1959, both on the 2nd of November. One was in the Montagne Posée area, on Mahé island. The other was at Anse Bois de Rose, in Praslin. Both fires are believed to have started through carelessness during rubbish burning. They were promptly put out by the Forestry Division personnel and cooperating members of the public.

108. The vanilla plantations in the re-afforested areas of Mahé were maintained in 1959. It was decided not to extend them on account of the high rate of praedial larceny. Consideration has been given, however, to leasing small plots of re-afforested areas to Forestry personnel for growing vanilla. This should result into close supervision of the leased plots by the lessees and would enable the extension of the present vanilla plantations, while solving the problem of praedial larceny. As reported elsewhere, a large number of vanilla cuttings were issued free of charge to vanilla growers from the forest areas in 1959.

109. To supply the Public Works Department with timber for its large building programme, the Crown Lands had to be combed for trees in 1959. Several stands of Albizzias, at Grand'Anse, Le Niol and Sans Soucis, were thus exploited. As they had under-storeys of saplings, they had to be carefully lopped and felled, the lopped branches being lowered on ropes some 70 to 80 feet to the ground. Most of the timber produced had to be carried on head over at least 3 miles of difficult terrain. This resulted of course in increased cost of production. With the coming into production of the re-afforested areas, exploitation and extraction of timber should be easier and less costly, as instead of scouring Crown Lands for small stands of trees, the Forestry personnel will be able to work in concentrated plantations. The details about the 1959 Forestry produce are given in Appendix E.

Capucin	*Northea sp.*
Bois Rouge	*Newcormia ferruginea*
Bois de Natte	*Mimosops sp.*
Gayac	*Intsia bijoga*
Bois de Fer	*Vateria sechellarum*

XV. Fisheries

110. No fisheries development work was effected in 1959, as the Fisheries Development Officer had not been appointed by the end of the year. However, one is expected to be appointed and to assume duty early in 1960. It has been decided to remove the Fisheries Division from the Department of Agriculture, from 1960, and to create a separate Fisheries Department.

XVI. Produce Inspection and Routine Laboratory Work

(a) *Produce Inspection*

111. As in previous years, the Produce Inspector, stationed at the Custom Sheds, in Victoria, was responsible for the inspection and sampling, when necessary, of copra, cinnamon bark, dry patchouli leaf and salt fish. In general the quality of the produce deposited for export was of a good standard. There were the usual lots of copra and other produce which were rejected for too high a moisture content or improper preparation.

112. Samples of essential oil deposited for export were, as usual, collected for examination in the routine laboratory.

(b) *Routine Laboratory Work*

113. The Routine Laboratory, which is under the supervision of the Agricultural Chemist, examines and tests samples of produce collected by the Produce Inspector and examines samples of all essential oils and patchouli leaf deposited for export. It also examines various samples for the Excise Department and other Government departments and the public.

114. The laboratory dealt with a total of 690 samples of produce for export, fermented liquors and miscellaneous items in 1959, as compared with 703, 892 and 921 in 1956, 1957 and 1958 respectively. A large part of the work continued to be provided by the export of cinnamon leaf oil, 381 samples being taken for examination. One sample of cinnamon leaf oil was found adulterated with mineral oil (kerosene). The other samples examined consisted mainly of fermented liquors. Lime, cattle-dip and miscellaneous samples were also examined and reported on. The following table records the results of examinations of fermented liquors in recent years. These samples are the result of seizures by the Police and may consist of fermented sugarcane juice, fermented coconut toddy or liquors known as "La Purée", which may have been fermented from a variety of substances :

	1955	*1956*	*1957*	*1958*	*1959*
Number of samples of fermented liquors submitted	100	238	428	398	238
Percentage of samples found to be "La Purée"	36.0	15.5	19.9	29.4	60.5

115. Other works carried out in the laboratory in 1959 included distillations of oil from samples of patchouli leaf deposited for export and

the testing of temperate-climate vegetable seeds imported by the Department prior to and during the period the seeds were on sale to the public.

XVII. Crown Land Supervision and Administration

116. The area of Crown Land remained unchanged and, as already stated, consists of some 15,000 acres, about half of which is leased and the remainder operated from 16 stations or sub-stations, ranging in size from 1 man guardian posts to those where a hundred men and women are employed. The leased Crown Lands consist of distant madreporic atolls and islands, of Land Settlement plots and of various house sites on Mahé island. The unleased Crown Lands consist of forest areas, which are worked and exploited by the Forestry Division; of land of public utility, such as the sites of police stations, sub-accountants' offices, schools, hospitals, clinics, leper settement and quarantine station; of the Botanic Gardens, where the Headquarters of the Department are situated, the Government House grounds and town gardens, and of estates. Of the latter Grand'Anse has been retained for a Research Station, Union Vale is devoted to the Government Dairy, Anse Boileau, Foret Noire, Rose Belle and Souvenir are being allocated to settlers while Ste. Anne island, which is partly leased, is still managed as a coconut estate.

117. Produce from Crown Lands consists of timber, cinnamon products, coconuts and copra, sugar cane, small quantities of fruits and food-crops and livestock and milk. The timber is supplied to the Public Works Department and other Government Departments, such as the Technical Centre and the Port Office. The coconuts are converted into copra, which is exported, or are sold by tender. The cinnamon products, consisting of cinnamon leaf and cinnamon bark, are usually cropped by contractors. The sugar cane is supplied to the Victoria Bacca Club for the manufacture of bacca, which is a local beer made of fermented sugar cane juice. The fruits and food-crops are supplied to Government Institutions. The livestock and milk are sold to the public and are also supplied to Government Institutions. Details about she produce from Crown Lands in 1959 are contained in Appendices D and E.

118. As in preceding years, the Crown Lands and estates were cleaned and cropped on a regular basis. Hower, as reported in 1957 and 1958, a large part of the coconut crop was lost through praedial larceny, which is highly prevalent generally in the Colony. Fire breaks were maintained around and and across the Crown forests. Special attention was given to the up-keep of the Vallée de Mai, in Praslin, the home of the famous Coco-de-mer palm *Lodoicea maldivica* Pers. and of a rare endemic bird, the Praslin Black Parrot *Coracopsis barklyi* Newton, and to the Botanic Gardens, in Victoria, where there is a large collection of endemic and exotic plants, especially of tropical palms and pandani. The Park Superintendent of the City of Nairobi, who visited the Colony in October, presented the Botanic Gardens with a collection of bougainvilleas and other ornamentals.

XVIII. General

119. It is gratifying to be able to record the award, in the Birthday Honours List, of the British Empire Medal to Mr. Robert

Dubuisson, Technical Officer of the Land Settlement Scheme, previously Senior Forest Ranger, in connection with his work on re-afforestation in Mahé.

120. Overseas visitors to the Department and Botanic Gardens, in 1959, included :

Mr. C. Swabey, Forestry Adviser to the Secretary of State.

Dr. D. E. Faulkner, Director of the Nyasaland Veterinary Services.

Mr. A. P. Mitchell C.M.G., late Director of Land, Mines and Surveys, Uganda.

Mr. M. D. Lucie-Smith, Director of Agriculture, Mauritius.

Mr. H. P. Greensmith, M.B.E., Park Superintendent, City of Nairobi.

Dr. J. Hurrell Crook, Field Station for the Study of Animal Behaviour, Department of Zoology, Cambridge University.

Mr. H. Legrand, Chargé de Mission, Paris Muséum d'Histoire Naturelle.

A United Kingdom Parliamentary Delegation consisting of :

Mr. P. Williams, Member for Sunderland (South).

Mr. T. G. Thomas, Member for West Cardiff.

121. Three meetings of the Agricultural Board were held in 1959, at two of which Mr. C. Swabey and Dr. D. E. Faulkner addressed the members.

122. In February the cruise-ship "Caronia" paid a visit to the Seychelles. As in previous years, a small exhibition of local spices and other produce and of curious endemic plants was held at the Botanic Gardens, Victoria.

GUY LIONNET,
Acting Director of Agriculture.

Headquarters,
Department of Agriculture,
Victoria, Mahé.
15th February, 1960.

APPENDICES

A. STAFF

as at 31st December

Appointment	Name	Remarks
Director of Agriculture	Vacant	The Agricultural Chemist acted as Director during the whole year.
Agricultural Officer	S. M. Savy B. Sc. Agric. (Glasgow), Dip. Agric. (Cantab.), D. T. A. (Trin.)	Returned from study leave in September.
Agronomist	C. J. Piggott B. Sc. Hons. Agric. (Read.), Dip. Agric. Sci. (Cantab.), D. T. A. (Trin.)	Assumed duty in May.
Inspector of Plantations & Supervisior Botanic & Town Gardens	A. Gendron	
Land Settlement Officer	Vacant	F. V. Fenton relinquished the post in July, on medical grounds.
Land Settlement Technical Officer	R. Dubuisson B.E.M.	
Land Settlement Technical Officer	Vacant	
Stock Inspector	D. Morgan	Left in May for a training course in Kenya. Was replaced from May to December by H. Benson.
Agricultural Chemist	J. F. G. Lionnet Dip. Agric. (Maur.)	Acted as Director during the whole year.
Laboratory Assistant	P. Loustau-Lalanne	Was in charge of Produce Inspection from January to October.
Produce Inspector	B. Paton	Assumed duty in November. Replaced R. de Lafontaine.
Entomologist	I. W. B. Nye B. Sc., Ph. D., D. I. C., F. R. E. S.	Assumed duty in March. Seconded from Colonial Pool of Entomologists.

Appointment	Name	Remarks
Melittomma Supervisor	J. Dookly	
Forester	F. Strawbridge	
Assistant-Forester	A. Moulinié	
Agricultural Assistant & Senior Forest Ranger, Praslin	E. Pool, B.E.M.	
Senior Forest Ranger, Grand'Anse	J. Barbier	Transferred from post of Manager, Anse Boileau, in July.
Fisheries Development Officer	Vacant	New post
Chief Clerk	J. Laye-Sion	Was on overseas leave from May to September. D. Pothin acted during this period.
Store-keeper & Paymaster, Headquarters	A. Hoareau	Assumed duty on 9th November, on transfer of D. Pothin to Treasury.
Paymaster Stations & Sub-Stations	R. Bakas	

In addition there were 26 other Agricultural Assistants and 3 clerks.

B. Agricultural Board

The Agricultural Board consisted of the following members in 1959 :

The Hon. D. Bailey O.B.E., J.P.
The Hon. H. C. Gontier
The Hon. E. de C. Mazerienx O.B.E.
The Hon. H. Savy
Dr. The Hon. Mrs. M. H. Stevenson-Delhomme
The Hon. E. Stravens
Mr. R. Delpech
Mr. J. Hadee
Mr. H. Jorre de St. Jorre
Mr. E. Nageon de Lestang
Mr. F. Parsons
Mr. S. Rassool
Mr. K. St. Ange

C. Legislation

No agricultural legislation was enacted during 1959. However, as already reported, "A Plan for Seychelles" was adopted by the Legislative Council in November, 1959.

D. Agricultural Produce from Crown Lands

(a) *Coconuts and Copra*

Coconut Collections were as follows :

Origin	*Number Collected*
Grand'Anse	171,880
Anse Boileau	102,676
Foret Noire	85,040
Union Vale	32,663
Ste. Anne Island	205,343
Curieuse Island	159,035
Long Island	10,160
Minor Mahé Crown Lands	7,592
Praslin Crown Lands	10,517
Total	784,906

Disposal of coconuts was as follows :

Stock on 1.1.59	21,281	Converted into copra	546,065
Collection	784,906	Sales and free issues	216,600
		Bad nuts	3,063
		Stock on 31.12.59	40,459
	806,187		806,187

Copra Production (Kilogrammes)

Stock on 1.1.59	571	Consigned for export	76,619
Production	78,314	Copra milled	91
		Sold by Tender (2nd grade copra)	570
		Stock on 31.12.59	1,605
	78,885		78,885

Conversion Rates

	Average number of coconuts per ton of copra
Grand'Anse	6,443
Curieuse	8,143

The coconuts from Anse Boileau, Foret Noire, Union Vale and the minor Mahé Crown Lands were sent to Grand'Anse for conversion into copra. Those from the Praslin Crown Lands were sent to Curieuse island for conversion into copra. Those from Ste. Anne Island were sold by tender.

(b) *Cinnamon Products*

Cinnamon leaf and bark sold by tender :

Leaf	279 tons
Green scraped bark	136½ ,,
Green unscraped bark	180 ,,
Cinnamon quills produced at Grand'Anse for export	965 kilos
Cinnamon quillings produced at Grand'Anse for export	401 ,,

(c) *Sugar Cane and Bacca*

The sales of sugarcane to the Victoria Bacca Club totalled 212½ tons in 1959. Some 10,270 bottles of bacca were purchased from the Club for sale to labourers at Grand'Anse.

(d) *Milk and Livestock*

A total of 213,546 pints of milk were produced at Union Vale, 197,684 of which were supplied to 237 customers and to Government institutions. The rest (15,862 pints) was fed to calves.

E. Forestry Produce

Timber Species	*Planks*	*Madrier*	*Beams* (*Running Feet*)	*Posts*	*Rondins*
Albizzia	46,423	86,643	7,456	—	—
Agati	2,907	2,090	—	—	—
Breadfruit	1,113	—	—	—	—
Badamier	1,283	—	—	—	—
Calice du Pape	—	—	—	1,102	—
Casuarina	983	1,773	—	593	291
Eucalyptus	—	6,916	750	1,973	—
Jak	—	868	—	—	—
Parkia	1,693	—	—	—	—
Pomme	—	98	—	—	—
Takamaka	2,191	3,437	—	—	—
Santol	5,901	6,296	—	226	48
Sangdragon	—	1,415	—	—	—
Kapok	194	—	—	—	—
Bois Rouge	—	—	—	568	—
Capucin	—	—	—	1,245	—
Total	62,688	109,536	8,206	5,747	339

Other Forest Produce

Cordwood 97¾ cords

Charcoal 108½ cords

Offcuts or Slabs 619 units

Cloves 2,300 lbs. (green weight)

Vanilla Beans 43.2 lbs. (green weight) (11.3 lbs. cured weight)

Cinnamon Bark 183.4 tons (green weight by tenderer)

Cinnamon Leaves 67.9 tons (green weight by tenderer)

Latanier Leaves 5,175 units.

Madriers are planks 2 inches thick.
Rondins are round pieces of wood.

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G. Local Measures and Conversion Table

1 Arpent	1.043 acres
1 French foot	1.06 English feet
1 Gaulette	10 French feet or 10.6 English feet
1 Metric Ton	1000 kilogrammes
1 Long Ton	1016 „
1 Kilogramme or kilo	1000 grams
1 English Pound	453.6 grams
1 French „	500 grams
1 Ell	4 English feet or 3.77 French feet
1 Hundredweight	50.803 kilogrammes
1 Cord	48 cubic feet (French) or 50.08 cubic feet (English)
1 Litre	1000 cubic centimetres
1 Bottle	$\frac{2}{3}$ of a litre or 666.6 cubic centimetres
1 Chopine	$\frac{1}{3}$ of a litre or 333.3 cubic centimetres
1 Quart	$\frac{1}{2}$ of a chopine of 166.6 cubic centimetres
1 Gallon	4.546 litres
1 Touque	22 litres
1 Velte	$\frac{1}{3}$ of a touque or 7.333 litres
1 Rupee	1/6 sterling

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